

"QUIZ" for Lecture 4

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E-MAILSCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q4FirstLast.pdf) ASAP BUT NO LATER THAN Sept. 17, 8:00pm

1. Find a parametric equation for the tangent line to the curve with the given parametric equation at the specified point

$$x = \cos t, \quad y = \sin t, \quad z = t^2 + 1; \quad (1, 0, 1)$$

$$\begin{aligned} \cos t = 1 & \quad \sin t = 0 & \quad t^2 + 1 = 1 & \quad r'(t) = -\sin t, \cos t, 2t \\ t = 0 & \quad t = 0 & \quad t = 0 & \quad r'(0) = 0, 1, 0 \\ (1, 0, 1) + (t)(0, 1, 0) & \rightarrow (1, t, 1) & \quad x=1 \quad y=t \quad z=1 \end{aligned}$$

2. Find $r(t)$ if

$$r'(t) = t\mathbf{i} + 2\mathbf{j} + (t+1)\mathbf{k}$$

and

$$r(0) = \mathbf{i} + 2\mathbf{j} + 3\mathbf{k}$$

$$\int (t\mathbf{i} + 2\mathbf{j} + (t+1)\mathbf{k}) dt = \frac{t^2}{2}\mathbf{i} + 2t\mathbf{j} + \left(\frac{t^2}{2} + t\right)\mathbf{k} + C$$

$$r(0) \rightarrow \mathbf{i} + 2\mathbf{j} + 3\mathbf{k} = C \quad r(t) = \frac{t^2}{2}\mathbf{i} + (2t)\mathbf{j} + \left(\frac{t^2}{2} + t\right)\mathbf{k} + \mathbf{i} + 2\mathbf{j} + 3\mathbf{k}$$

$$r(t) = \left(1 + \frac{t^2}{2}\right)\mathbf{i} + (2+2t)\mathbf{j} + \left(3 + \frac{t^2}{2} + t\right)\mathbf{k}$$